

**TWO NEW SPECIES OF *PHAENOCARPA* FOERSTER (HYMENOPTERA:  
BRACONIDAE: ALYSIINAE) FROM SOUTH AMERICA**

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**Abstract.**—Two new species of *Phaenocarpa* Foerster are described from South America: *P. hyalina* Trostle and *P. pericarpa* Wharton and Carrejo. *Phaenocarpa pericarpa* was reared from *Anastrepha distincta* Greene in pods of *Inga*, representing the first host record for *Phaenocarpa* in South America. A key separating the South American species of *Phaenocarpa* is included.

**Key Words:** *Anastrepha*; parasitoid; Diptera; Neotropical

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Papp (1969) revised the species of *Phaenocarpa* Foerster for the Neotropical Region, treating 10 species. Papp (1966, 1969) included *Asobara* Foerster as a synonym of *Phaenocarpa* in his earlier works, but Fischer (1971) subsequently removed *Asobara* from synonymy and it has been recognized as a separate genus ever since. Consequently, five of the 10 species treated by Papp (1969) must now be placed in *Asobara*. These are *anastrephae* (Muesebeck), *gahani* (Papp), *mexicana* (Ashmead), *pleuralis* (Ashmead), and *rubra* (Papp). Their identity has been confirmed by one of us (RAW), and the placement of two of these species has been discussed previously (Wharton 1994).

A sixth species, *delicata* Papp, has several unusual features, and its placement is uncertain (Wharton 1980, Fischer 1994). Papp (1969) divided the four remaining species into those with well-developed notauli and those without. Wharton (1994) described three additional species from the Neotropics. He further defined two distinct species groups to accommodate these, and discussed the differences which set these

two groups apart from other described species of *Phaenocarpa*.

Two more species are described here. The first belongs to the *cratomorpha* Wharton species group as defined by Wharton (1994). The second belongs to Papp's (1969) group with reduced notauli.

The genus *Phaenocarpa* is fairly large, but hosts have been recorded for only about 15% of the 150 described species (Fischer 1974, 1975, 1990, 1993; Shenefelt 1974; Wharton 1984; Vet and van Alphen 1985; Tobias 1986). Holarctic species have been reared most frequently from calypterate Diptera breeding in such habitats as fungus, dung, flower heads and other seed bearing structures. A few have also been recorded from acalypterates such as drosophilids and sciomyzids (Papp 1972, Fischer 1975, Wharton 1984, Vet and van Alphen 1985, van Achterberg 1988). Hosts have not been previously recorded for any of the Neotropical species of *Phaenocarpa*.

MATERIALS AND METHODS

Terminology is as in Wharton (1980, 1994) except as follows: venation conforms

to the standards recently established by Sharkey and Wharton (1997); scutellar sulcus is used in place of prescutellar pits; the terms mesonotal disc (or simply disc) and anterior declivity are retained in their former meaning, but are referred to as parts of the mesoscutum. Measurements are given to the nearest 0.05.

Museum acronyms are as follows: The Natural History Museum, London (BMNH), Texas A&M University Insect Collection (TAMU). Part of the material for this study was sorted from general BMNH accessions by RAW, the remainder was reared by NSC as part of a program to determine natural enemies of fruit-infesting tephritid flies of the genus *Anastrepha* in Colombia.

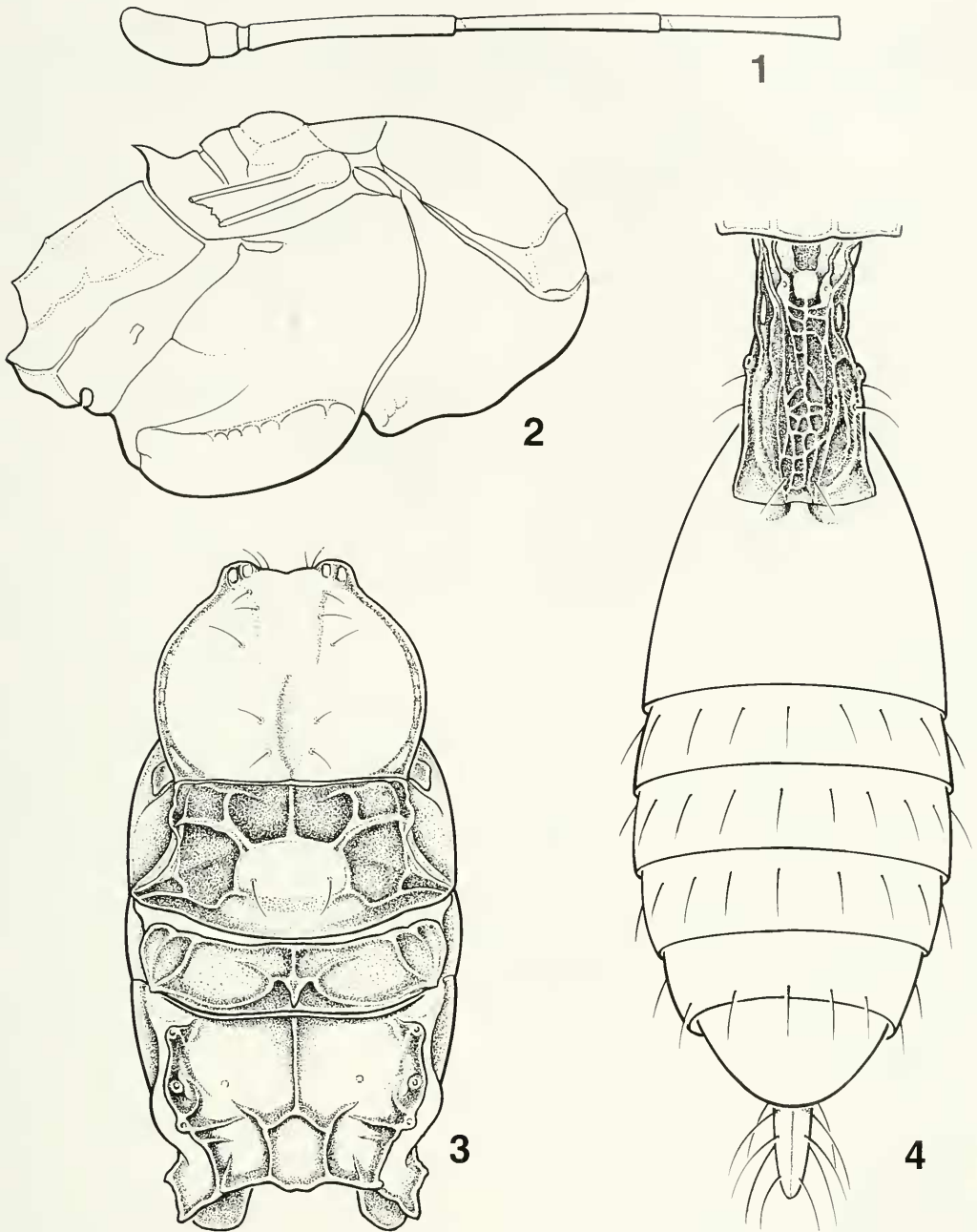
KEY TO NEOTROPICAL SPECIES OF  
*PHAENOCARPA*

- 1. Second flagellomere at least 1.4 times longer than first (Figs. 12–14) . . . . . 2
  - Second flagellomere at most 1.1 times longer than first (Fig. 1) . . . . . 6
- 2. Second submarginal cell short, with 2RS nearly equal to or slightly longer than 3RSa . . . . . 3
  - Second submarginal cell longer (Fig. 7), with 3RSa at least 1.25 times longer than 2RS . . . . . 4
- 3. Notauli distinct posteriorly. Mandible with tooth 1 extending distinctly distad tooth 3 . . . . . *Phaenocarpa coxalis* (Szépligeti)
  - Notauli absent posteriorly, not reaching midpit on mesoscutum. Mandible with tooth 3 extending distinctly distad tooth 1 . . . . . *Phaenocarpa anomala* Wharton
- 4. Mandible with broad tooth 1 separated from tooth 2 by a deep cleft (Fig. 15). Fore wing (RS+M)b distinctly more than half length of m-cu (Fig. 7) . . . . . *Phaenocarpa pericarpa* Wharton and Carrejo, n. sp.
  - Mandibular teeth 1 and 2 connected by a broad, undulant flange, not separated from each other by a deep cleft (Fig. 10). Fore wing (RS+M)b short to absent, distinctly shorter than half length of m-cu . . . . . 5
- 5. Petiole dark brown, narrowly elongate, about 1.5 times longer than apical width; apex about 1.6 times wider than base. Propodeal areola distinct; transverse carina of propodeum absent laterally . . . . . *Phaenocarpa heynei* Papp
  - Petiole dark yellow, broader, about 1.2 times longer than apical width, apex about twice wider than base. Propodeal areola indistinct; trans-

- verse carina complete to spiracles . . . . . *Phaenocarpa subtilistriata* Papp
- 6. Stigma of fore wing broad distally, abruptly narrowing basad junction with r in females (Fig. 5), with posterior margin indistinct on basal half; divided by a hyaline, desclerotized line in males, with portion of stigma posteriad hyaline region broader than portion along anterior margin of wing (Fig. 6). Mesopleuron, metapleuron, and propodeum dark brown. Metanotum in lateral view with short but distinct spine (Fig. 2) . . . . . *Phaenocarpa hyalina* Trostle, n. sp.
  - Stigma of fore wing narrow distally and basally, only gradually narrowing basad junction with r in females, with posterior margin clearly delineated on basal half; males in which the stigma is divided by a desclerotized line have the portion that is posteriorad the desclerotized, hyaline region narrower than the portion along the anterior margin of the wing. Body color and development of metanotal projection variable . . . . . 7
- 7. Mesopleuron, metapleuron, and propodeum yellow. Metanotum in lateral view with short, narrow spine-like projection (as in Fig. 2) . . . . . *Phaenocarpa sharkeyi* Wharton
  - Mesopleuron, metapleuron, and propodeum dark brown, contrasting with light brown to yellow mesoscutum. Metanotum in lateral view with broadly triangular projection (distinctly broader than high) . . . . . *Phaenocarpa cratomorpha* Wharton

***Phaenocarpa hyalina* Trostle,  
new species  
(Figs. 1–6)**

Female.—*Head*: Moderately transverse in dorsal view, 1.3× wider than long. Face punctate, setiferous but polished, 1.25–1.35 higher than wide. Frontoclypeal suture broad, relatively shallow, unsculptured. Clypeus broad, weakly convex, barely protruding. Frons smooth, bare, nearly flat, weakly concave medially. Mandible 1.85× longer than width between tooth 1 and 3, surface largely smooth; tooth 1 broad, nearly orthogonal, with dorsal margin concave; distinct cleft present between tooth 1 and 2, tooth 2 lacking additional tooth or knob; tooth 2 acutely triangular, short, 0.4–0.45× apical width of mandible, but extending beyond tooth 1 and 3; tooth 3 broadly trian-

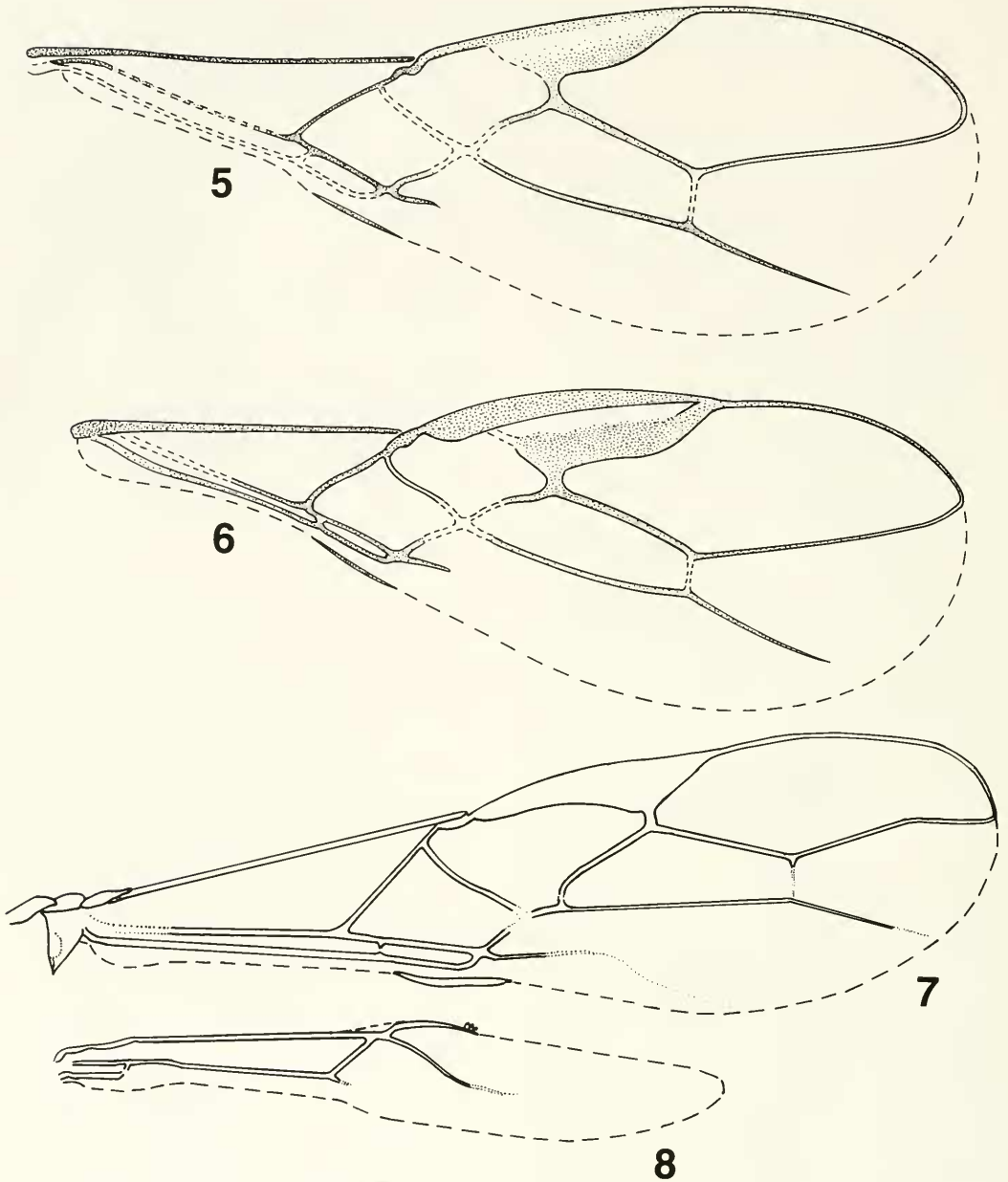


Figs. 1-4. *Phaenocarpa hyalina*. 1, Antenna showing relative lengths of basal 3 flagellomeres. 2, Mesosoma, lateral view, showing metanotal spine. 3, Mesosoma, dorsal view. 4, Metasoma, dorsal view.

gular. Eye large,  $4.25-5\times$  longer than temple. Anterior tentorial pit large, extending more than  $0.5\times$  distance from lateral margin of clypeus to eye. Antenna 25-27 segmented; second flagellomere  $1.0-1.05\times$

longer than first; first flagellomere  $1.1-1.3\times$  longer than third. Eye-antennal sulcus absent.

*Mesosoma*:  $1.35-1.5\times$  longer than high. Pronotum predominately smooth, with lon-



Figs. 5-8. Wings. 5, *Phaenocarpa hyalina*, female. 6, *P. hyalina*, male. 7, 8, *P. pericarpa* fore and hind wing.

gitudinal carina separating dorsal and lateral portions, and fine crenulae laterally extending ventrally from this carina; pronotum dorsally a narrow band with a shallow, barely perceptible median pit; anterior margin weakly emarginate. Mesoscutum pol-

ished; anterior declivity vertical, sparsely setose; notauli extending medially as carinate ridges along dorsal margin of anterior declivity, then proceeding posteriorly as weak, parallel grooves perpendicular to the carinate ridges, notaular grooves evanescent

near anterior margin of midpit; 3–4 pairs of setae extending from transverse portion of notauli to transscutal articulation; midpit well developed, extending anteriorly  $0.4\times$  length of disc from transscutal articulation. Scutellar sulcus about  $2\times$  broader than long, with medial carina; lateral margins of axilla flangelike. Metanotum with posterior margin a broad, flat plate, elevated medially as a prominent spine, median field with or without carinae radiating from spine. Propodeum areolate, as in other members of the *cratomorpha* species group. Mesopleuron with small patch of rugose sculpture on anterior margin medially, otherwise smooth, polished, virtually bare; carinately margined posteriorly. Sternaulus sinuate, crenulate over anterior  $0.65$ , smooth over posterior  $0.35$ . Metapleuron largely unsculptured, as in *P. sharkeyi*.

*Wings*: Fore wing stigma  $4.5\text{--}5.0\times$  longer than broad, solid throughout (i.e., without hyaline streak), basal half distinctly narrower than distal half with posterior margin of basal half indistinct and somewhat excavated, stigma abruptly widening near junction with r; r short, slightly shorter than and arising slightly distad mid-width of stigma;  $3RSa$   $1.4\text{--}1.8\times$  longer than  $2RS$ ;  $3RSb$  extending to wing tip, weakly curved at apex;  $(RS+M)b$  usually absent;  $1cu\text{-}a$  often very short, postfurcal by  $1.25\text{--}3.5\times$  its length. Hind wing with  $1M$   $2.4\text{--}3.5\times$  longer than  $M+CU$ ; 3 hamuli.

*Metasoma*: Petiole  $1.6\text{--}1.7\times$  longer than apical width, apex  $1.5\text{--}1.6\times$  wider than base, dorsal carinae on petiole more or less parallel sided, weakly converging and becoming less prominent posteriorly; surface sculpture often granular-rugose medially; more finely rugose laterally. Ovipositor sheath with 3 irregular rows of approximately 7 setae each. Ovipositor  $0.9\times$  and ovipositor sheath  $0.65\times$  length of mesosoma.

*Color*: Generally brown; mesoscutum, metanotum and occasionally propleuron bright orange yellow; mesopleuron, metapleuron, propodeum and petiole dark

brown; legs white at coxae and gradually darkening to yellow distally; maxillary palp white; face variable, dark brown to light orange yellow, usually paler near antennae; scape and pedicel bright yellow with pedicel slightly paler; basal 16–18 flagellomeres gradually darkening from yellow to brown distally, followed by 4–7 white flagellomeres, and terminating with 1–3 (usually 1.5) brown flagellomeres; wings hyaline.

*Body length*: 2.1–2.4 mm

*Male*.—Similar to female except as follows: head  $1.3\text{--}1.4\times$  wider than long; face  $1.1\text{--}1.2\times$  higher than wide; mesosoma  $1.45\text{--}1.55\times$  higher than wide; body  $2.3\text{--}2.9$  mm; fore wing stigma longitudinally bisected for most of its length with the thickened portion along anterior margin of wing almost completely separated from posterior portion by hyaline streak, the two portions only narrowly joined distally, posterior portion broader than anterior portion.

*Biology*.—Unknown

*Material examined*.—Holotype ♀: “Brasilien Nova Teutonia  $27^{\circ}11'N$ .  $52^{\circ}23'W$ . 2-ix-1935 Fritz Plaumann” (BMNH). Paratypes (BMNH, TAMU): 2 ♂, same data as holotype; 2 ♀, 10 ♂, same except viii.1935, xi.1935, 6.iii.1936, and 15.x.1935; 1 ♀, 2 ♂, same locality but country spelled “Brazil:” and with B.M. Accession label “B.M.1937-656”, collected 11.vii.1937, and 7.v.1937; 2 ♀, 2 ♂, same as preceding, but “B.M. 1938-682”, collected 20.iv.1938, 13.viii.1938, 23.iv.1938, and 3.v.1938.

*Diagnosis*.—This species is a member of the *cratomorpha* species group as defined by Wharton (1994). As in other species of this group, *P. hyalina* has the second flagellomere equal to or barely longer than the first (Fig. 1), a median metanotal projection (Fig. 2), and a hyaline streak longitudinally bisecting the male stigma (Fig. 6). The stigma is sexually dimorphic, lacking a well-defined streak in females. *Phaenocarpa hyalina* differs from other described species of this group in the possession of a broader stigma that narrows more abruptly basad

the junction with *r*. Further, the metanotal projection of *P. hyalina* is much more spinose than in *P. cratomorpha*, displaying a thinner, finer apex. Obvious color differences exist between *P. sharkeyi* and *P. hyalina*. *Phaenocarpa sharkeyi* is more uniformly pale yellow in coloration, contrasting with the darker brown portions of the head, meso- and metasoma of *P. hyalina*.

Discussion.—This species is named for the hyaline streak that almost completely bisects the stigma in males, resulting in separate anterior and posterior portions. Additional differences in size and shape between males and females were noted by Wharton (1994) in his description of *P. cratomorpha*. Detailed scrutiny of males and females of *P. hyalina*, however, fails to reveal significant differences between the sexes for most of these same characters. Since so few individuals of *P. cratomorpha* were available for study, it is quite possible that the differences recorded by Wharton (1994) in the size and shape of the eye and petiole were simply intraspecific rather than specifically intersexual. Measurements of individuals from the much longer series of *P. hyalina* demonstrate that these quantitative characters are highly variable within each sex.

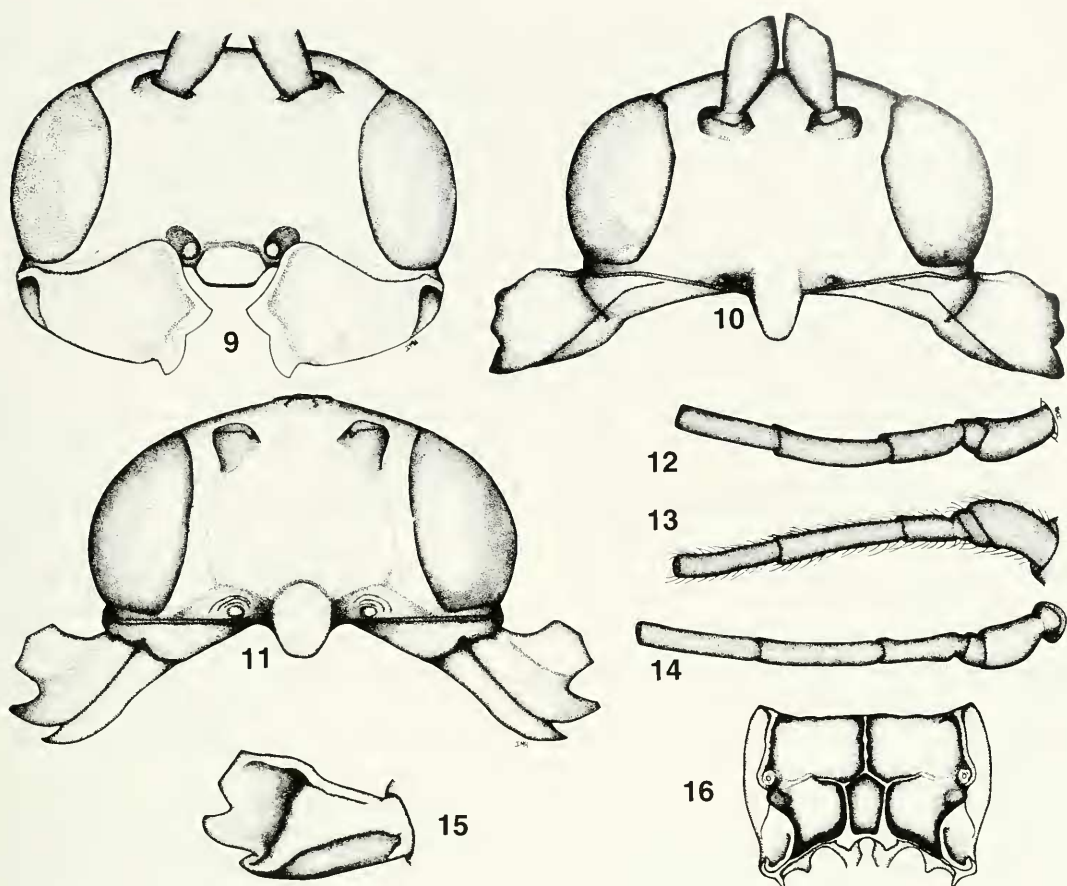
Although a distinct hyaline streak is present in males and absent in females, the stigma in females of *P. hyalina* exhibits modifications suggesting a morphocline leading to the extreme condition expressed in males. The stigma in females has a slight indication of desclerotization in a position comparable to the basal portion of the hyaline streak in males. Further, the stigma is exceptionally narrow basally, distad the parastigma, then somewhat abruptly widens where it meets *r*. In most other species of *Phaenocarpa*, the posterior margin of the stigma is straight to evenly convex between *r* and the parastigma. *Phaenocarpa hyalina* and the species described below are exceptional in this regard.

***Phaenocarpa pericarpa* Wharton and Carrejo, new species**

(Figs. 7, 8, 11, 14–16, 19)

Female.—*Head*: Moderately transverse in dorsal view, about 1.5–1.6× wider than long; eyes strongly bulging beyond temples. Face finely punctate, the punctations separated by much more than their diameter, otherwise smooth and polished between base of antenna and frontoclypeal suture; frontoclypeal suture deep and very wide, transversely striate; clypeus exceptionally narrow and strongly protruding, lateral margin of clypeus distinctly separated from anterior tentorial pit, the latter small, set within broad concavity between clypeus and lower margin of eye, the concavity transversely striate at least in part. Malar space absent. Frons smooth, polished, evenly and weakly convex, bare except for 2–4 short setae along eye margin laterad ocelli. Vertex bare. Mandible 1.4–1.5× longer than apical width, distinctly expanded apically, apex 1.7–1.85× wider than base, surface with strigose sculpture extending from middle of diagonal ridge to dorsal margin at base of tooth 1; tooth 1 very broad, orthogonal, separated by deep cleft from narrowly triangular tooth 2; tooth 2 without dorsal knob; tooth 3 extending distally not quite as far as tooth 1, narrower and more rounded than the latter. Eye very large, 5.2–6.0× longer than temple, with a few, scattered, minute setae visible at 50×. Antenna 39 segmented; second flagellomere 1.5–1.7× longer than first, 1.1× longer than third. Maxillary palp very long, about twice height of head.

*Mesosoma*: 1.45–1.55× longer than high. Pronotum dorsally smooth, polished, but uneven: with small, u-shaped depression medially along anterior margin; weakly elevated as a small, rounded bump posteromedially; flattened laterally. Mesoscutum smooth, polished, with setae confined to a short row along notauli on anterior declivity, absent on disc; notauli shallow, weakly sculptured, confined to anterior de-



Figs. 9-16. *Phaenocarpa* spp. 9-11, Faces. 9, *P. subtilistriata*. 10, *P. heynei*. 11, *P. pericarpa*. 12-14, Antennae showing relative lengths of basal 3 flagellomeres (setal pattern shown only on Fig. 13). 12, *P. subtilistriata*. 13, *P. heynei*. 14, *P. pericarpa*. 15, *P. pericarpa*, mandible. 16, *P. pericarpa*, propodeum.

clivity; midpit small, shallow, oval. Scutellar sulcus twice as wide as long, or nearly so; with a single median ridge; lateral fields polished, unsculptured. Metanotum with thin, longitudinal flange along midline, the flange sloping more precipitously anteriorly than posteriorly, not elevated above level of scutellum. Propodeum smooth, polished, with well-defined pentagonal areola delimited by strong carinae; areola narrow, about half as wide as tall, confined to posterior half of propodeum; anterior half with a strong median carina; lateral carina extending from areola to spiracle usually very weak over lateral half. Sternaulus long, narrow, sinuate, complete from anterior margin to mid coxa, weaker posteriorly; crenulate

anteriorly, the sculpture weakening posteriorly and usually absent over posterior 0.3-0.5. Metapleuron finely punctate but otherwise polished and unsculptured over most of surface.

*Wings*: Fore wing stigma weakly concave basally along posterior margin, gradually widening distally towards junction with r, solid throughout, about 5× longer than width at r, r arising from distal 0.7-0.75; r very short, 0.15-0.20× length of 2RS; 2RS sharply angled near posterior 0.2; 3RSa 1.25-1.35× longer than 2RS, second submarginal cell gradually narrowing distally; 3RSb ending at wing tip, weakly and evenly bowed; m-cu distinctly antefurcal, with (RS+M)b 0.65-0.8× length of m-cu;

1cu-a postfurcal by 2–3× its length; 2CU interstitial: arising directly in line with 1CU. Hind wing very narrow, about 6× longer than wide; 1M 2.0–2.5× longer than M+CU; 2M very short, angled towards posterior margin, m-cu absent.

*Metasoma*: Petiole 1.3–1.45× longer than apical width; apex 1.8–1.9× wider than base; surface strigose, the sculpture distinct medially, often weak laterally; dorsal carina strong basally, evanescent at level of spiracles, absent posteriorly; dorsope large and deep. Remaining terga without sculpture. Ovipositor of moderate length, ovipositor sheath not fully exposed in material available for examination, but about 2.0–2.3× longer than mesosoma; ovipositor finely tapered to apex, without discernible subapical node or notch.

*Color*: Dark brown; mandible, scape, pedicel, propleuron and petiole variously lighter brown or red-brown in most specimens; flagellomeres 1–4 brown, 5–12 and 19–29 dark brown, 14–18 white, and 13 bicolored brown and dark brown; fore and mid legs and hind coxa and trochanter yellow to dark yellow, hind femur mostly yellow with dark spot dorsally over apical 0.3–0.4, hind tibia and tarsus brown; hypopygium apically and apical tergite yellow or yellow brown; palps white.

*Male*.—A single male, probably representing this species, fits the above description except as follows: face shorter, about 1.5× wider than high; mandible less expanded distally, about 1.8× longer than apical width; fore wing 1cu-a postfurcal by only about 1.4× its length; and fore wing 3RSa about 1.6× 2RS. Flagellomeres 15 and 16 are dirty white, with remaining flagellomeres dark brown.

*Biology*.—Reared from puparia of *Anastrepha distincta* Greene in pods of guama (*Inga* sp.: Fabaceae).

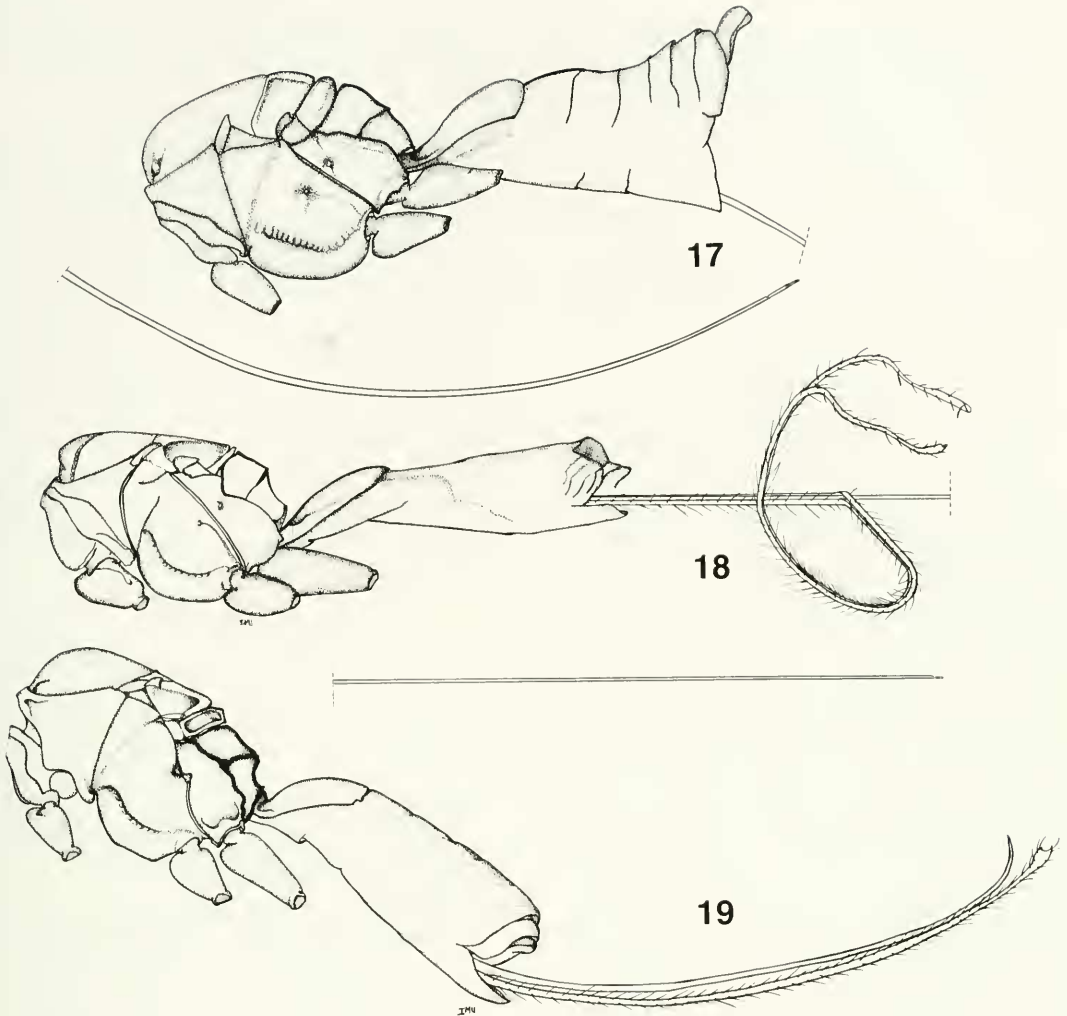
*Material examined*.—Holotype ♀: "COLOMBIA Dept. del Valle del Cauca Mun. Buenaventura, Corregimiento de Zacarias 23.iii.1994 N. Carrejo ex *Anastrepha distincta* on Guama" Deposited in La Univer-

sidad del Valle, Museo de Entomología. *Paratypes*: 3 ♀, same data as holotype (TAMU; Universidad del Valle; and Instituto de Ciencias Naturales, Universidad Nacional de Colombia). *Additional material (not a paratype)*: 1 ♂, VENEZUELA, Aragua, Parque Nacional Henri Pittier, Rancho Grande, 1,100m, 12.i.1996, R. Wharton (TAMU).

*Diagnosis*.—As in both *P. heynei* and *P. subtilistriata*, this species has reduced notauli, a short first flagellomere, and a large second submarginal cell. It differs from both of these species by the possession of a shorter ovipositor (compare Fig. 19 with Figs. 17, 18) which lacks a subapical node or notch and a broader, more discrete tooth 1 on the mandible (Fig. 15). The ovipositor is more than three times longer than the mesosoma in *P. heynei* and *P. subtilistriata*. The shape of the mandible is sufficient for separating *P. pericarpa* from all other described New World species of *Phaenocarpa*.

*Discussion*.—Papp (1969) adequately differentiated *P. heynei* from *P. subtilistriata*, noting especially the difference in shape of the petiole. There are also slight differences in sculpture between the holotypes of *P. heynei* and *P. subtilistriata*. The propodeal areola is essentially obliterated in *P. subtilistriata*, with the posterior face strigose or weakly rugulose below the well-developed and complete transverse carina. A weak areola is present in *P. heynei*, and the transverse carina is incomplete, not reaching the propodeal spiracle. The sternaulus is also broader and more heavily sculptured in *P. subtilistriata* but the scutellar sulcus is smooth with a single median carina. In *P. heynei*, the scutellar sulcus is weakly sculptured on either side of the median sulcus. Although both *P. heynei* and *P. subtilistriata* are known only from the holotype, and variation thus cannot be assessed, these same sculptural features show little variation in the four specimens of *P. pericarpa*. Thus, it is likely that these relatively minor sculptural differences will be





Figs. 17–19. Meso- and metasoma, lateral view. 17, *Phaenocarpa subtilistriata*. 18, *P. heynei*. 19, *P. pericarpa*.

useful for species-level recognition of *P. heynei* and *P. subtilistriata*.

Several features suggest that *P. heynei* shares a sister group relationship with *P. pericarpa* relative to *P. subtilistriata*. Although the clypeus is narrow in all three species, it is more strongly narrowed and protruding in *P. heynei* and *P. pericarpa* (Figs. 10, 11), with consequent detachment of the anterior tentorial pit from the lateral margin of the clypeus. Similarly, 2M in the hind wing is shorter and more distinctly deflected posteriorly in *P. heynei* and *P. pericarpa* than in *P. subtilistriata*, which retains

the more plesiomorphic form of a longer, more distally-directed 2M. The fore wing stigma of *P. heynei* is also more similar to the unusually shaped stigma of *P. pericarpa* than the more typically shaped stigma of *P. subtilistriata*. *Phaenocarpa subtilistriata* appears to form a link between the *heynei*+*pericarpa* sister group and the more typical *Phaenocarpa* species from the Holarctic Region. This hypothesized relationship between *P. heynei* and *P. pericarpa* leads the suggestion that the *Gnathopleura*-like mandible of *P. heynei* and *P. subtilistriata* is a more primitive feature from

which the *P. pericarpa* configuration was derived. Despite similarities in the mandible, *P. heynei* and *P. subtilistriata* can be readily separated from *Gnathopleura* since the latter has a much smaller second submarginal cell.

The putative relationship between *P. heynei* and *P. pericarpa* is based on features which, though unusual, are found elsewhere in *Phaenocarpa* and related genera. A similarly narrow hind wing with reduced 2M is found in the *Phaenocarpa cratomorpha* species group, for example. A narrow, strongly protruding clypeus is found in at least two species of *Asobara* (one from Brazil and one from Papua New Guinea) which otherwise lack shared derived features. In all of these cases, the character states in question are hypothesized as independent derivations.

This is the first host record for any of the Neotropical species of *Phaenocarpa*. The type series of *P. pericarpa* was reared from the tephritid fly *Anastrepha distincta* Greene, developing in the pods of guama (*Inga* sp.). Relatively few tephritids have been recorded as hosts of Alysiniinae (Wharton 1984). Only one, *Asobara anastrephae* (Muesebeck), has been verified as a parasitoid of fruit-infesting tephritids. *Asobara orientalis* Viereck, originally described from material thought to be reared from dacine tephritids, is undoubtedly a drosophilid parasitoid. Three other alysiine species have been reared either from tephritids in flower heads or other plant parts, and at least four additional species have been reared from unknown hosts in fruit. *Asobara anastrephae* is interesting because of its exceptionally large size and unusual host preferences relative to other species of *Asobara*, which are primarily drosophilid parasitoids. *Asobara anastrephae* belongs to a group of Neotropical species with typical *Asobara* fore wing venation, loss of hind wing cu-a, a short, broad petiole, and brightly colored bodies (Muesebeck 1958, Wharton 1994). One of the derived members of this group, as yet undescribed, exhibits the same clypeal

modifications found in *P. pericarpa* and *P. heynei*.

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